

CLAIMS

1. A method comprising:  
forming a trench in a substrate;  
providing at least one metalized surface along said trench; and  
applying a bonding surface having a metalized capping surface to said substrate such that said  
metalized capping surface is located over said trench having said at least one metalized surface so as  
to form a waveguide structure.

2. The method of claim 1, wherein said substrate comprises a printed circuit board.

3. The method of claim 1, wherein said substrate comprises a dielectric material.

4. The method of claim 3, wherein said trench is formed by selectively removing portions  
of said dielectric material.

5. The method of claim 1, wherein said at least one metalized surface comprises sidewall  
surfaces and a bottom surface of said waveguide structure.

6. The method of claim 1, wherein said metalized capping surface on said bonding  
surface is formed by applying a metal coating on said bonding surface and selectively removing  
portions of said metal coating such that said metalized capping surface remains on said bonding  
surface.

1           7.       The method of claim 1, wherein said metalized capping surface on said bonding  
2 surface is formed by providing said bonding surface and selectively placing said metalized capping  
3 surface on said bonding surface.

1           8.       The method of claim 1, further comprising filling said trench with a material.

1           9.       A method comprising:  
2           forming a trench in a printed circuit board substrate, said trench having a first side surface, a  
3 second side surface and a bottom surface;  
4           forming at least one surface on said first side surface, said second side surface and said  
5 bottom surface of said trench; and  
6           forming a top surface over said trench having said at least one surface.

1           10.      The method of claim 9, wherein said at least one surface comprises at least one  
2 metalized surface and said top surface comprises a top metalized surface.

1           11.      The method of claim 10, wherein said substrate comprises a dielectric material.

1           12.      The method of claim 11, wherein said trench is formed by selectively removing portions  
2 of said printed circuit board substrate.

1           13.      The method of claim 11, wherein forming said top metalized surface over said trench  
2 comprises affixing a bonding surface having a metalized capping surface to said printed circuit board

3 substrate.

1 14. The method of claim 13, wherein said top metalized surface on said bonding surface  
2 is formed by applying a metal coating on said bonding surface and selectively removing portions of said  
3 metal coating such that said top metalized surface remains on said bonding surface.

1 15. The method of claim 13, wherein said top metalized surface on said bonding surface is  
2 formed by providing said bonding surface and selectively aligning said top metalized surface on said  
3 bonding surface.

1 16. The method of claim 9, further comprising filling said trench with a material.

1 17. A method comprising:  
2 forming a trench in a printed circuit board; and  
3 forming a waveguide structure in said trench of said printed circuit board, said waveguide  
4 structure having at least one metalized surface.

1 18. The method of claim 17, wherein said trench comprises a first sidewall, a second  
2 sidewall and a bottom wall.

1 19. The method of claim 18, wherein said waveguide structure comprises said at least one  
2 metalized surface on said first sidewall, said second sidewall and said bottom wall and a metalized  
3 surface on a top of said trench.

1           20.     The method of claim 17, wherein said waveguide structure is formed by providing at  
2     least one metalized surface along said trench, and bonding a bonding surface having a metalized  
3     capping surface to said printed circuit board such that said metalized capping surface is located over  
4     said trench having said at least one metalized surface so as to form said waveguide structure.

1           21.     The method of claim 17, further comprising filling said trench with a material.

1           22.     A structure comprising:  
2     a printed circuit board;  
3     bonding material provided on at least one surface of said printed circuit board; and  
4     a waveguide structure provided within said printed circuit board.

1           23.     The structure of claim 22, wherein said printed circuit board comprises a trench formed  
2     within said printed circuit board between a top surface of said printed circuit board and a bottom surface  
3     of said printed circuit board.

1           24.     The structure of claim 23, wherein said trench comprises a first sidewall, a second  
2     sidewall and a bottom wall.

1           25.     The structure of claim 24, wherein said waveguide structure comprises at least one  
2     metalized surface on said first sidewall, said second sidewall and said bottom wall and a metalized  
3     capping surface on a top of said trench and adjacent said bonding material.

- 1      26.      The structure of claim 23, wherein said trench is filled with a material.